

AMENDMENTS TO THE CLAIMS

Claim 1 (Currently Amended): A metal sheet with anticorrosive coating formed from an anticorrosive paint on at least one side thereof, wherein

said anticorrosive paint contains a metallic zinc powder in an amount of 55 - 85 mass% of its solids;

said anticorrosive paint contains at least one kind of metal salt rust inhibitor in an amount of 1 - 20.3 mass% of its solids; ~~and~~

said metal salt is a salt of a metal which is more base than zinc; and

the metal salt rust inhibitor is a fine powder having an average particle diameter no larger than 1 μm .

Claim 2 (Original): The metal sheet with anticorrosive coating as defined in Claim 1, wherein the substrate is a steel sheet.

Claim 3 (Original): The metal sheet with anticorrosive coating as defined in Claim 1, wherein the coating film has a thickness ranging from 5 μm to 30 μm .

Claim 4 (Original): The metal sheet with anticorrosive coating as defined in Claim 1, wherein the metallic zinc powder has an average particle diameter ranging from 0.01 μm to 20 μm .

Claims 5-7 (Canceled)

Claim 8 (Original): The metal sheet with anticorrosive coating as defined in Claim 1, wherein the metal salt rust inhibitor is a phosphate.

Claim 9 (Original): The metal sheet with anticorrosive coating as defined in Claim 1, wherein the metal salt rust inhibitor is a phosphomolybdate.

Claim 10 (Original): The metal sheet with anticorrosive coating as defined in Claim 1, wherein a phosphate coating film is interposed between the metal sheet and the coating film of the anticorrosive paint.

Claim 11 (Previously Presented): A method of making a metal sheet with anticorrosive coating, the method comprising
coating an anticorrosive coating on a metal sheet; and
producing the metal sheet with anticorrosive coating as defined in Claim 1.

SUPPORT FOR THE AMENDMENTS

This Amendment cancels Claim 6; and amends Claim 1. Support for the amendments is found in the specification and claims as originally filed. In particular, support for Claim 1 is found in canceled Claim 6. No new matter would be introduced by entry of these amendments.

Upon entry of these amendments, Claims 1-4 and 8-11 will be pending in this application. Claim 1 is independent.

REQUEST FOR RECONSIDERATION

Applicants respectfully request entry of the foregoing and reexamination and reconsideration of the application, as amended, in light of the remarks that follow.

The present invention provides a metal sheet with an anticorrosive coating formed from an anticorrosive paint containing metallic zinc powder and at least one kind of metal salt rust inhibitor, where the metal salt is a salt of a metal that is more base than zinc.

Corrosion prevention by zinc has long been known, and metal salt rust inhibitors are also known. Specification at page 4, lines 4-6.

However, the present inventors are the first to find that a marked anticorrosive effect is produced by the **combination** of zinc powder with a metal salt inhibitor, where the metal salt is a salt of the metal which is more base than zinc. Specification at page 4, lines 6-10.

Claims 1-4, 8 and 11 are rejected under 35 U.S.C. § 103(a) over EP 0722933 A1 ("Shinohara"). In addition, Claim 6 is rejected under 35 U.S.C. § 103(a) over Shinohara and further in view of U.S. Patent No. 4,294,808 ("Wasel-Nielen"). Claim 9 is rejected under 35 U.S.C. § 103(a) over Shinohara and further in view of U.S. Patent No. 4,040,842 ("Mekishima"). Claim 10 is rejected under 35 U.S.C. § 103(a) over Shinohara and further in view of U.S. Patent No. 6,117,251 ("Rivera").

Claim 6 is incorporated into independent Claim 1.

Applicants traverse the rejection of Claim 6, as it applies to independent Claim 1, because any *prima facie* case of obviousness based on the cited prior art is rebutted by the significant improvement in corrosion resistance that is achieved by the invention of Claim 6 with the combination of zinc powder and metal salt rust inhibitor, where the metal salt rust inhibitor is a fine powder having an average particle diameter no larger than 1 μm .

The Advisory Action states:

The applicant has argued specifically against the rejection of claim 6, asserting that the combination of Wasel-Nielsen with Shinohara does not teach the required average particle size. The applicant further argues that the claimed particle size unexpectedly improves the corrosion resistance, as shown by table 1 in the specification. First, the applicants showing in Table 1 is inconclusive at best, as the improved corrosion resistance in sample 9 (as compared to samples 12-13) could simply be arising from the fact that sample 9 utilizes **10.3%** rust inhibitor whereas samples 12 and 13 utilize only 6.52% and 5.83% rust inhibitor respectfully. Advisory Action dated February 9, 2004, at page 3, lines 4-11.

Applicants respectfully traverse the Advisory Action's assertion that Sample No. 9 utilizes 10.3 mass% rust inhibitor. As shown in the Table 1, reproduced below, Sample No. 8 utilizes 10.3 mass% rust inhibitor. However, **Sample No. 9** utilizes **4.53** mass% rust inhibitor, which is quite comparable to the 6.52 mass% and 5.83 mass% rust inhibitor of Sample Nos. 12-13, respectively.

Table 1

Sample No.	Metal sheet	Surface prepa- ration	Zinc powder (mass%)	Metal salt rust inhibitor				Pitting corrosion resistance	Red rust resistance	Corrosion resistance after coating
				Kind	Average particle diameter (μm)	Amount used (mass%)				
1	Cold rolled steel sheet	None	65	Aluminum phosphomolybdate	0.38	5.83	A	A	B	
2	Cold rolled steel sheet	None	65	Magnesium phosphate	0.37	5.72	A	A	B	
3	Cold rolled steel sheet	P (0.8)	85	Magnesium phosphate	0.37	2.02	A	A	A	
4	Cold rolled steel sheet	P (0.8)	65	Magnesium phosphate	0.48	6.00	A	A	A	
5	Cold rolled steel sheet	P (0.9)	65	Aluminum phosphomolybdate	0.35	1.63	A	A	A	
6	Cold rolled steel sheet	P (0.7)	65	Aluminum phosphomolybdate	0.46	5.66	A	A	A	
7	Cold rolled steel sheet	P (0.7)	65	Magnesium phosphate plus Aluminum phosphomolybdate	0.45 0.38	1.89 3.52	A	A	A	
8	Cold rolled steel sheet	P (2.1)	80	Magnesium phosphate	0.89	10.3	A	A	A	
9	Cold rolled steel sheet	P (2.7)	75	Calcium phosphate	0.65	4.53	A	A	A	
10	Cold rolled steel sheet	P (0.3)	55	Aluminum phosphomolybdate	0.75	20.3	A	A	B	
11	Cold rolled steel sheet	P (2.0)	65	Magnesium phosphate	0.89	30.5	B	B	A	
12	Cold rolled steel sheet	P (2.7)	75	Calcium phosphate	1.35	6.52	B	B	A	
13	Cold rolled steel sheet	P (2.2)	75	Calcium phosphate	2.55	5.83	B	B	B	
14	Cold rolled steel sheet	P (2.2)	38	Magnesium phosphate	0.75	7.85	B	C	B	
(1)	Cold rolled steel sheet	None	None	None	--	--	C	D	C	
(2)	Cold rolled steel sheet	None	65	None	--	--	C	D	C	
(3)	Cold rolled steel sheet	P (0.8)	65	None	--	--	C	D	C	

Parenthesized sample Nos. indicate comparative samples.

In the column of surface preparation, "P" denotes phosphate coating and the parenthesized number that follows P denotes the coating weight (g/m^2).

The Final Rejection at page 5, section 16, admits that Shinohara "does not teach the use of a metal salt rust inhibitor having an average particle diameter no larger than 1 μm ", but asserts that Wasel-Nielen suggests this feature of Claim 6. However, Wasel-Nielen discloses anticorrosive pigments where at least 90% of the particles have a size between 0.05 and 8 μm . Wasel-Nielen at abstract. Wasel-Nielen is silent about the Claim 6 feature of "an average particle diameter no larger than 1 μm ". Furthermore, the cited prior art fails to suggest the significant improvement in corrosion resistance provided when the average particle diameter is no larger than 1 μm , which is illustrated in the specification at Table 1 by comparing the good corrosion resistance of Sample No. 9 of the present invention having a metal salt (calcium phosphate) average particle diameter of 0.65 μm with the poor corrosion resistance of comparative Sample No. 13 having a metal salt (calcium phosphate) average particle diameter of 2.55 μm .

Because the cited prior art fails to suggest the significant improvement in corrosion resistance that is achieved by the invention of Claim 6 with a combination of zinc powder and the metal salt rust inhibitor, where the metal salt rust inhibitor is a fine powder having an average particle diameter no larger than 1 μm , any *prima facie* case for the obviousness of Claim 6, now incorporated into independent Claim 1, is rebutted and should be withdrawn.

In view of the foregoing amendments and remarks, Applicants respectfully submit that the application is in condition for allowance. Applicants respectfully request favorable consideration and prompt allowance of the application.

Should the Examiner believe that anything further is necessary in order to place the application in even better condition for allowance, the Examiner is invited to contact Applicants' undersigned attorney at the telephone number listed below.

Respectfully submitted,

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